Washington State Department of Transportation

Memorandum

April 20, 2005

TO: David L. Edwards/Gary J. McKee
NW Region, MS NB82-117

FROM: T. M. Allen/D.A. Williams
E&EP Geotechnical Division, 47365

SUBJECT: SR-202, OL-3498
SR 520 to Sahalee Way NE – Stage 2
Addendum 2 to Final Geotechnical Report

Introduction

The recommendations in this memorandum are intended to supplement our Final Geotechnical Report dated November 8, 2004. As requested in your March 25, 2005 letter, we are supplying additional geotechnical recommendations for two new walls, Wall 23 and Wall 24. Both walls are located on an unpaved access road within the Wetland Mitigation Site # 2, and west of the existing King County Stormwater Pond. The walls are required to support new 3H:1V cut slopes within our right-of-way and the King County Stormwater Pond site. Specifically, the walls are located on the SW and NW corners of the King County property boundary as shown in the revised Figure E-3.

The analyses, conclusions, and recommendations presented in this report are based on the project description and site conditions that existed at the time of the field exploration. We assume the exploratory borings represent the subsurface conditions throughout the wall alignments. If different subsurface conditions are encountered or appear to be present, we should be contacted so that we can reevaluate our recommendations and assist you.

Field Exploration

No additional investigation was performed for the preparation of this addendum. At both locations, we used the existing test hole information. We used the existing test hole behind the proposed Wall 23 site, H-38-02 for our design. Copies of the test hole logs were included in the final Geotechnical Report dated November 8, 2004.

Site Soil Conditions

At Walls 23 and 24, there are two major soil units. The two units are as follows:

- Fill – Loose to medium dense, well-graded gravel with sand with cobbles and large chunks of concrete. The thickness of this unit varies between 1 ft and 4 ft.

- Recessional Outwash - Medium Dense to dense, well-graded gravel with sand to well-graded sand with silt.

Surface Water and Groundwater

The water levels have been monitored in test hole, H-38-02 and P-16-02. H-38-02 is within 5 ft of the SW corner of the King County Pond site behind Wall 23. P-16-00 is approximately 100 ft west of the NW corner of the King County Pond site. Ground water varies between elevations 76.2 ft and 79.8 ft, which is between 4.5 ft and 8 ft below the finished access roadway grade. The lowest level was observed during the late summer to early fall months (August to November). Water levels are summarized on Table 10 in Appendix E of the final Geotechnical Report and are also listed on the test hole logs.

Geotechnical Recommendations

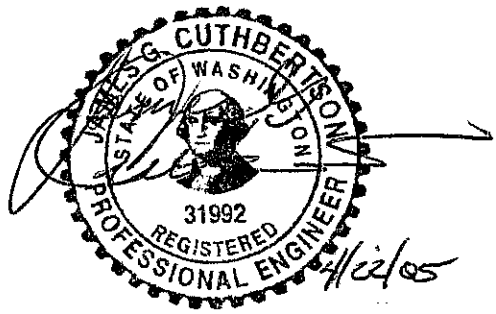
Both Wall 23 and Wall 24 will be in a cut section, which will support the King County Pond site along a new access road (U-line). The current plan shows a 3H:1V cut starting at the current King County right-of-way line. Wall 23 is located between Stations U 11+10 and U 11+45, 9.5 ft Right, which will require a wall approximately 30 ft long with a maximum exposed wall height of 3.5 ft. Wall 24 is located between Stations U 12+32 and U 12+44, 9.5 ft Right, which will require a wall approximately 10.5 long with a maximum exposed wall height of 1.9 ft.

Based on our review of the boring logs, cut slopes in the vicinity of the new walls will be stable at a 1.75H:1V. If the slopes can be steepened, we may be able to delete Wall 24 and reduce the required length of Wall 23.

We recommend either a rock wall or a gravity block wall be constructed at this location for Walls 23 and 24, if cut slopes are not used. We recommend the wall be embedded a minimum of 1.5 ft below the finished grade in front of the wall to provide an adequate factor of safety for overall stability. Both of these wall types should conform to design requirements in Sections 8-24 and 9-13.7 of the Standard Specifications. If a Gravity Block Wall is selected, the current GSP (24.GR8, 2402.GR2402, 24021.GR8, 240302.GR8, and 2403021.GR8) should be included in the contract. For your information, we have provided a typical Gravity Block Wall section in Figure 1.

Since the new walls will be placed in medium dense, well-graded sands and gravels and a maximum exposed wall height of 3.5 ft, the standard drainage detail may be deleted. The native soil can be used a backfill provided that the soil is compacted in accordance with Method B in Section 2-03.3(14)C of the Standard Specifications.

If you have any questions regarding this memorandum, please contact Donald Williams at (360) 709-5457.



EXPIRES 03-13-06

Prepared By: Donald A. Williams
Geotechnical Engineer

Reviewed By: Jim Cuthbertson
Chief Foundation Engineer

TMA:daw
DAW
Attachments

cc: Brian Dobbins, NW Construction PE, NB82-105 (2copies)
Hung Huynh, NW Design Office, NB82-117
Gary J. McKee, NW Design Office, NB82-117 (3 copies)
Chris Johnson, NW Materials Engineer, NB82-29

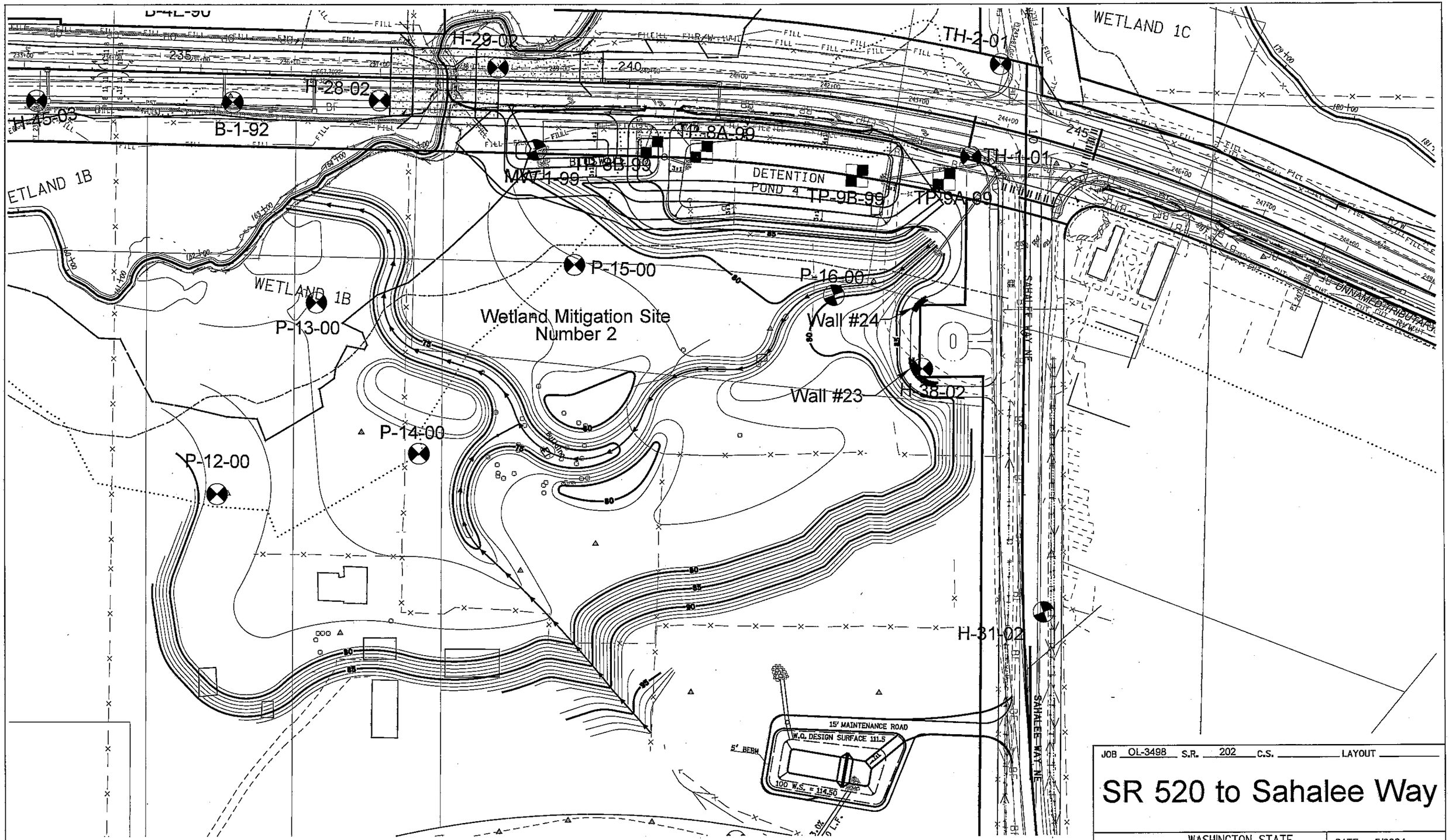


Figure E-3: Plan View with Test Hole Locations for Wetland Mitigation Site Number 2

JOB OL-3498 S.R. 202 C.S. _____ LAYOUT _____

SR 520 to Sahalee Way

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE 5/2004
SCALE 1"=100' VERT.
1"=100' HORIZ.
SHEET ____ OF ____
DRAWN BY DWG

...\E and C\202floodplansheets.dgn 04/08/2005 11:09:53 AM

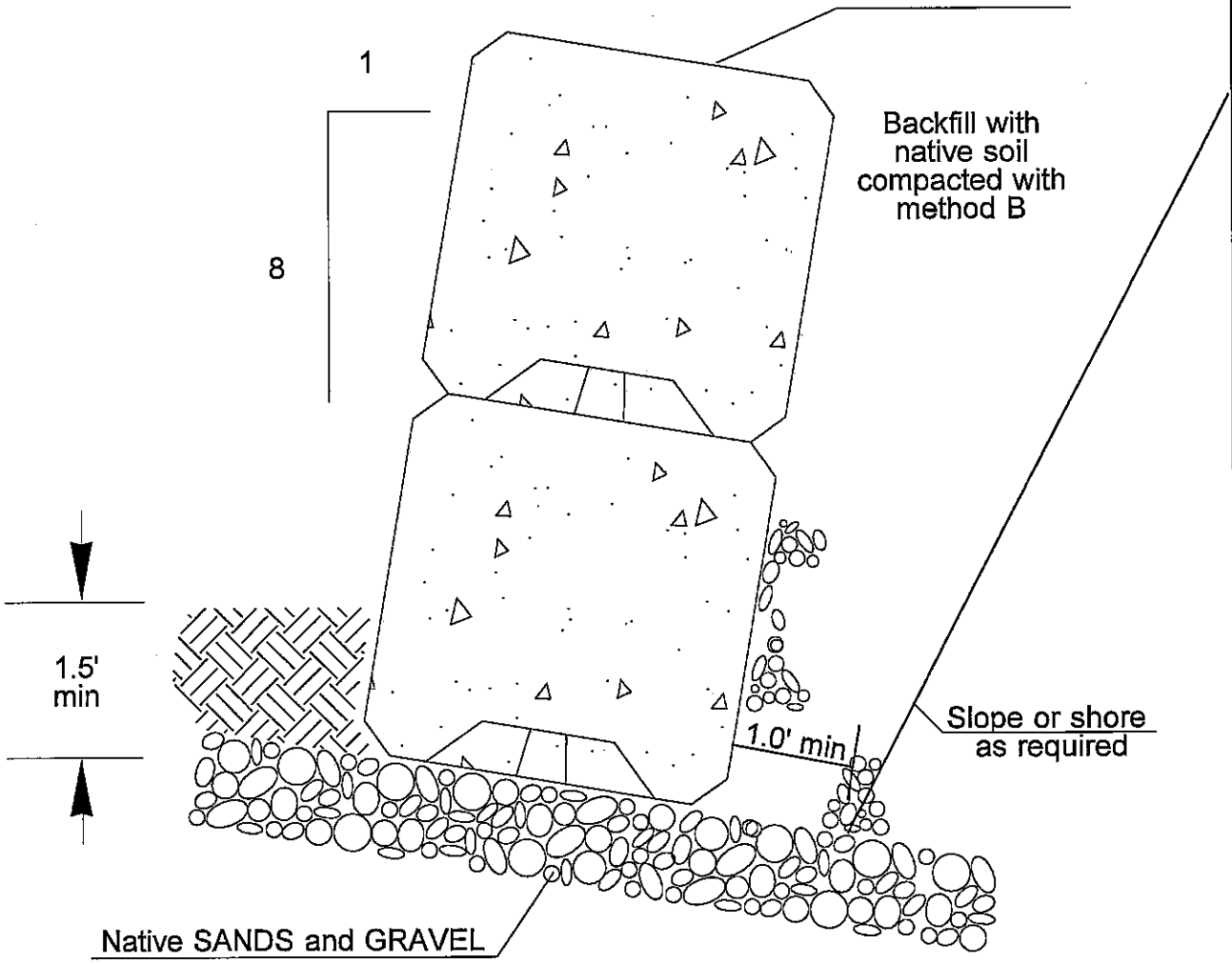


Figure 1: Gravity Block Wall

JOB OL-3498 S.R. 202

SR-520 to Sahalee Way NE
Wetland Mitigation Site #2

WASHINGTON STATE TRANSPORTATION COMMISSION
DEPARTMENT OF TRANSPORTATION
MATERIALS BRANCH
T. E. BAKER MATERIALS ENGINEER

DATE 4/2005
SCALE Not to Scale VERT. HORIZ.
SHEET ___ OF ___
DRAWN BY DWG

...\004-21-04\Wall details.dgn 04/20/2005 03:08:41 PM

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 62069

HOLE No. H-38-02

Sheet 1 of 2

Job No. OL-3498 SR 202 Elevation 89.0 ft (27.1 m)

Project SR 202 - SR520 to Sahalee Way NE

Driller Vince Johnson Lic# 2532

Site Address

Inspector Cleo Andrews

Start December 11, 2002 Completion December 12, 2002 Well ID# AGS 690 Equipment CME 55 w/ autohammer

Station 243+94 Offset 280' Rt. Casing 4" OD Hollow Core Augers x 30.0' Method Auger

Northing 569719.3525 Easting 1665475.5847 Latitude Longitude

County King Subsection SW 1/4 of the NE 1/4 Section 17 Range 6 EWM Township 25 N

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
								0.0' to 4.0' Well graded Gravel with sand, modifiers cobbles and large chunks of concrete, fill material.		
5	1			9 8 7 (17)		D-1		Well graded GRAVEL with sand, subrounded, medium dense, yellowish brown, moist, Homogeneous, no HCl reaction, Length Recovered 1.0 ft, Length Retained 1.0 ft		
	2									
10	3			8 12 12 (24)		D-2	GS MC	SW-SM, MC=9% Well graded SAND and silt, medium dense, grayish brown, moist, Homogeneous, no HCl reaction Length Recovered 0.5 ft, Length Retained 0.5 ft	▼ 12/12/2002	
	4			23 14 4 (18)		D-3	GS MC	GW, MC=10% Well graded GRAVEL with sand, subrounded, medium dense, light olive brown, wet, Homogeneous, no HCl reaction. Length Recovered 0.7 ft, Length Retained 0.7 ft		
15	5									
				5 6 6 (12)		D-4		Well graded GRAVEL with sand, subrounded, medium dense, light olive brown, wet, Homogeneous, no HCl reaction Length Recovered 0.8 ft, Length Retained 0.8 ft		
20	6									

SOIL OL3498 SR202-SR 520 TO SAHALEE WAY NE.GPJ SOIL.GDT 4/8/05 9:07:04 A4

Washington State Department of Transportation

LOG OF TEST BORING

Start Card R 62069

HOLE No. H-38-02

Job No. OL-3498 SR 202 Elevation 89.0 ft (27.1 m)

Sheet 2 of 2

Project SR 202 - SR520 to Sahalee Way NE

Driller Vince Johnson Lic# 2532

Depth (ft)	Meters (m)	Profile	Standard Penetration Blows/ft (10 20 30 40)	SPT Blows/6" (N)	Sample Type	Sample No. (Tube No.)	Lab Tests	Description of Material	Groundwater	Instrument
	7			3 7 6 7 (13)		D-5		Well graded GRAVEL with sand, subrounded, medium dense, light olive brown, wet, Homogeneous, no HCl reaction Length Recovered 1.0 ft, Length Retained 1.0 ft		
25	8							End of test hole boring at 25 ft below ground elevation.		
	9							This is a summary Log of Test Boring. Soil/Rock descriptions are derived from visual field identifications and laboratory test data.		
30								Water table stabilized in piezo after bailing hole and a 30 minutes waiting period to 11.5' same as over night reading.		
	10									
35	11									
	12									
40	13									
45										

WATER LEVEL READINGS

DATE	DEPTH	ELEVATION
12/1/2002	-11.5	77.5
12/18/2002	-9.6	79.4
2/11/2003	-10.5	78.5
3/18/2003	-10.3	78.7
5/6/2003	-10.4	78.6
6/5/2003	-11.9	77.1
7/23/2003	-12.1	76.9
9/23/2003	-Destroyed	

SOIL OL3498 SR202-SR 520 TO SAHALEE WAY NE.GPJ SOIL.GDT 4/8/05 9:07:04 A4